

JOINT INTEROPERABILITY & ENGINEERING ORGANIZATION

CENTER FOR SOFTWARE

Management Plan MP

**15 March 1995**

SOFTWARE TEST PLAN (STP)

FOR THE

AIRFIELDS SYSTEM

Version 2.0.1

CM Number: LL-521-08-03

**( D R A F T )**

Revised 16 February 1996

**SUBMITTED BY:**

**APPROVED BY:**

**JAMES MOODY**  
Chief, General Applications  
Division

**SAMUEL PUCCIARELLI**  
Chief, Software  
Development Department

Copies of this document may be obtained from:

The Director CFSW  
Attn: Code JEXAG  
5600 Columbia Pike  
Falls Church, VA 22041

## **ACKNOWLEDGEMENT**

This document was prepared for the Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Center for Software (JEX), Software Development Department (JEXA), General Applications Division (JEXAG).

This Software Test Plan describes the software test environment to be used for the testing of the re-engineered/re-hosted Airfields system. The system, which was previously part of the Worldwide Command and Control System (WWMCCS), is a segment of the Global Command and Control System's (GCCS') Common Operating Environment (COE).

Any questions, comments, or considerations relative to this Software Test Plan should be directed to the following:

Global Command and Control System (GCCS) Hotline  
DSN: 653-8681  
Commercial: (703) 735-8681

## CONTENTS

SECTION	PAGE
ACKNOWLEDGEMENT.....	ii
1. <b>SCOPE</b> .....	1
1.1       Identification.....	1
1.2       System Overview.....	1
1.3       Document Overview.....	1
2. <b>REFERENCED DOCUMENTS</b> .....	3
3. <b>SOFTWARE TEST ENVIRONMENT</b> .....	4
3.1       DISA/JIEO/JEXAG.....	4
3.1.1       Software Items.....	4
3.1.2       Hardware and Firmware Items.....	5
3.1.3       Other Materials.....	5
3.1.4       Proprietary Nature, Acquirer's Rights, and Licensing.....	5
3.1.5       Installation, Testing, and Control.....	5
3.1.6       Participating Organizations.....	6
3.1.7       Personnel.....	6
3.1.8       Orientation Plan.....	6
3.1.9       Tests to be Performed.....	6
4. <b>TEST IDENTIFICATION</b> .....	7
4.1       General Information.....	7
4.1.1       Test Levels.....	7
4.1.2       Test Classes.....	7
4.1.3       General Test Conditions.....	7
4.1.4       Test Progression.....	7
4.1.5       Data Recording, Reduction, and Analysis....	7
4.2       Planned Tests.....	13
4.2.1       Items to be Tested.....	13
4.2.1.1       Graphical User Interface.....	13
4.2.1.2       One-Line Summary Report.....	15
4.2.1.3       One-Page Summary Report.....	17
4.2.1.4       Multi-Page Report.....	19
4.2.1.5       Turnaround Calculation.....	21
4.2.1.6       Selective Data Retrieval.....	23
5. <b>TEST SCHEDULES</b> .....	25
6. <b>NOTES</b> .....	26
6.1       Terms and Abbreviations.....	26

## **SECTION 1.       SCOPE**

1.1 Identification. The Airfields system provides the Worldwide Military Command and Control System (WWMCCS) community with a wide range of data about free world airfields. Associated with the Airfields System is an Airfields data base. The database is supplied by the Defense Mapping Agency Aerospace Center (DMAAC) and is updated monthly. The Airfields retrieval system was re-engineered from COBOL to the Ada 95 language and provides reports in several different formats both on- and off-line. The One-Line, One-Page Summary, Multi-Page, Selective Data Retrieval, and Turnaround reports are available for execution.

1.2 System Overview. The functional proponent for Airfields is the Joint Staff Logistics Directorate (J4). The office of primary responsibility (OPR) is the Operations Planning Division. The designated development Agency (DDA) is the Center for Software (JEX), Software Development Department (JEXA), General Applications Division (JEXAG).

The re-engineered system runs under the Unix environment on a Sun Solaris workstation, utilizes Oracle 7 (a relational database management system (RDBMS)), and is written in the Ada 95 programming language. Screen Machine was selected as the frontend Graphical User Interface (GUI).

The system complies with GCCS Integration Standards and employs many standards such as the Windowing capability and an extensive Help facility to aid the user with system operation. Primary operational sites include the Worldwide Military Command and Control System (WWMCCS) community and the Joint Staff.

The Airfields System has been in existence for approximately twenty years. In the mid to late 1980's, the Defense Mapping Agency Aerospace Center (DMAAC) changed the database format which resulted in the need to do a total redesign of the WWMCCS version of the system from COBOL 68 to COBOL 74. During that period, the access method also changed from Honeywell Indexed Sequential Processing (ISP) files to a flat file format.

Historically, WWMCCS users access the system approximately 100 times per month. The database, a WWMCCS-resident flat file database, is owned by the Defense Mapping Agency Aerospace Center (DMAAC) and contains data on approximately 44,000 airfields and consists of over one million records.

1.3 Document Overview. The purpose of this Software Test Plan (STP) is to describe plans for qualification testing of the

Airfields System. It describes the software test environment to be used for the testing, identifies the tests to be performed, and provides schedules for test activities. This Test Plan also:

- a. Provides guidance for the management and technical effort necessary throughout the test period.
- b. Establishes a comprehensive test plan and to communicate the nature and extent of the tests necessary to provide a basis for evaluation of the system.
- c. Coordinates an orderly schedule of events, a specification of equipment and organizational requirements, the methodology of testing, and a list of materials to be delivered.
- d. Provides a written record of the actual test inputs to exercise system limits and critical capabilities, the instructions to permit execution of tests, and the expected results.

## 2. **REFERENCED DOCUMENTS**

- a. Department of Defense, Military Standard Software Development and Documentation, MIL-STD-498, 5 Dec 1994
- b. Data Item Description (DID) number DI-IPSC-81438, Software Test Plan (STP), 5 Dec 1994
- c. Joint Interoperability & Engineering Organization (JIEO), Washington, DC, Software Development Plan (SDP) (Draft), 20 January 1995
- d. Joint Interoperability & Engineering Organization (JIEO), Washington, DC, Software Requirements Specification (SRS) (Draft), 20 January 1995
- e. Joint Interoperability Engineering Organization (JIEO), Washington, DC, Software Test Report (STR) (Draft), 15 April 1995
- f. Joint Interoperability Engineering Organization (JIEO), Washington, DC, Software Version Description (SVD) (Draft), 15 April 1995

### 3. SOFTWARE TEST ENVIRONMENT

3.1 DISA/JIEO/JEXAG. A software test environment has been established and testing in an unclassified environment will be conducted at DISA/JIEO/JEXAG at the following location:

Center for Operational Support  
5600 Columbia Pike  
Room 240  
Falls Church, VA 22041

The testing environment at the above location mirrors and is compatible with the Global Command and Control Systems environment at the OSF located in Reston, Virginia. Testing in a classified environment will be conducted at the OSF site.

3.1.1 Software Items. The following items are required in order to perform the planned testing activities for the Airfields System at the site named in Section 3.1 above:

a. Oracle SQL\*Net (server) and Oracle SQL\*Net (client), Version 7, is a relational database management system (RDBMS) utilized to establish a development environment that is compatible with the GCCS environment. Also included in the Oracle Version 7 package are the Oracle Protocol Drivers (TCP/IP) (for Server and Client), Oracle Pro\*Ada, and the Oracle Distributed Option. The original product was delivered on CD ROM and was downloaded to 8mm tape by the Software Development Department. The full Oracle package is resident on the system where testing will be performed.

b. The VADSSelf (Verdix/Sun Ada) Compiler is needed to support access to the Oracle database management system. This compiler was delivered on CD ROM and was downloaded to 8mm tape by the Software Development Department. This product is resident on the system where testing will be performed.

c. The GNAT Compiler, developed by New York University, is the most mature Ada 95 compiler to date. For that reason it was chosen as the compiler of choice for the re-hosting of the Airfields System to Ada 95. This product was delivered on CD ROM and was downloaded to 8mm tape by the Software Development Department. The GNAT compiler is resident on the system where testing will be performed.

d. Screen Machine, a Graphical User Interface (GUI) is required to generate Ada 95-compatible graphical user

interface code necessary to support the development of the Airfields application in the GCCS environment using Ada 95. The Original product was delivered on CD ROM and was downloaded to 8mm tape by the Software Development Department. This product is resident on the system where testing will be performed.

e. Open Database Connectivity (ODBC) Version 2.0 is used to link/bind the Airfields System application to the Airfields Database. It was necessary to use ODBC because, at the time of development, there were no Ada 95 bindings available. This product must be resident on the system where testing will be performed.

f. Sun Solaris Version 2.3 was selected as the development environment. Sun Solaris 2.3 was delivered on CD ROM and downloaded to 8mm tape by the Center for Operational Support. The Sun Solaris 2.3 environment has been established on the system where testing will be performed.

g. Airfields Executable. The Airfields executable will be resident on the system where testing is to be performed.

h. Airfields Database. The Airfields Database will be resident on the system where testing is to be performed. Hawaii data, which is unclassified, will be used at the 5600 Columbia Pike site. The entire database will be loaded and tested at the OSF in the GCCS classified environment.

i. Oracle Scripts and Files. Oracle scripts that are utilized for table creation and database manipulation are resident on the system where testing will be performed.

3.1.2 Hardware and Firmware Items. Software testing will be conducted on a SunSparc 1000 workstation.

3.1.3 Other Materials. Other materials to be used include the Airfields Software Test Plan, the Airfields Software User Manual, input/output listings obtained from Airfields Regression Testing that was conducted on the Airfields system on the WWMCCS computer at the Pentagon, and a WWMCCS baseline test data chart indicating the report executed, the input data used, timing metrics for end-to-end processing and report generation, and user interface errors encountered during the runs.

3.1.4 Proprietary Nature, Acquires's Rights, and Licensing. The GCCS will be responsible for managing licensing for the Open Database Connectivity (ODBC).



3.1.5 Installation, Testing, and Control. Segmentation must be accomplished prior to installing a newly delivered system. Refer to the following GCCS documentation for instructions to accomplish GCCS install and deinstall:

- a. GCCS Implementation Procedures for AIC  
GCCS Version 2.1, Route 0, Final  
Dated 27 September 1995  
CM Number LL-500-103-18
- b. GCCS System Administration Manual  
Route 0, Final  
Dated 29 September 1995  
CM Number LL-500-29-10

3.1.6 Participating Organizations. Participating organizations include the Global Command and Control System at the OSF in Reston, Virginia and the Center for Software Support located at 5600 Columbia Pike in Falls Church, Virginia.

3.1.7 Personnel. The following Defense Information Systems Agency (DISA) personnel:

- a. The GCCS System Administrator
- b. Center for Operational Support personnel

3.1.8 Orientation Plan. Prior to testing, the testers will be provided a copy of the Airfields User Manual which includes step-by-step instructions for the first time user of the system.

3.1.9 Tests to be Performed. Tests for the following capabilities will be accomplished:

- a. The Graphical User Interface will be tested for performance and reliability, appearance, speed, and for functionality.
- b. The One-Line Summary will be tested for performance and reliability, timing, erroneous input, maximum capacity, and output appearance and/or readability.
- c. The One-Page Summary Report will be tested for performance and reliability, timing, erroneous input, maximum capacity, and output appearance and/or readability.
- d. The Multi-Page Report will be tested for performance and reliability, timing, erroneous input, maximum capacity, and

output appearance and/or readability.

e. The Turnaround Report (which includes the coordinate/Radius calculation) will be tested for performance and reliability, timing, erroneous input, maximum capacity, and output appearance and/or readability.

f. The Selective Data Retrieval will be tested for performance and reliability, timing, erroneous input, maximum capacity, and output appearance and/or readability.

#### 4. **TEST IDENTIFICATION**

4.1 General Information. The following paragraphs contain General information applicable to the overall testing to be performed.

4.1.1 Test Levels. System level and CSCI level testing will be performed.

4.1.2 Test Classes. Test classes include testing of the graphical user interface, timing, tests for input of erroneous information, and maximum capacity/stress tests.

4.1.3 General Test Conditions. Each test outlined in this document shall measure performance and timing. Testing personnel will determine if the timing factors "PASSED" or "FAILED" when compared with the WWMCCS baseline system. Each report will also be tested for maximum capacity/stress of the system. Each report type will be tested for functionality, appearance, screen manipulation, and the HELP function will be tested. All screen functions such as the ADD, REMOVE, OK, and CANCEL functions will be tested for each report type.

4.1.4 Test Progression. Tests will be performed top down starting with the Graphical User Interface and continuing with the reports/retrievals in the order they are presented on the screen. Each function on each screen will be tested as the test progresses from screen to screen.

4.1.5 Data Recording, Reduction, and Analysis. The tester shall maintain a chart notating the input parameters/selection criteria used for each test. Additionally, the chart shall record end-to-end processing time, report generation processing time, indication of whether the timing tests PASSED or FAILED when compared to the figures gathered during baseline testing of the WWMCCS system, and notation of any user interface errors. The REMARKS section at the bottom of the page will be used for

any comments regarding the test being made that are not otherwise covered. A sample chart for manual input is displayed below:

AIRFIELDS ONE-LINE SUMMARY REPORT

DATA RECORDING & ANALYSIS

CRITERIA SELECTED	TIMING (END-TO-END)	TIMING (REPORT GENERATION)	USER INTERFACE ERRORS

REMARKS :

AIRFIELDS ONE-PAGE SUMMARY REPORT

DATA RECORDING & ANALYSIS

CRITERIA SELECTED	TIMING (END-TO-END)	TIMING (REPORT GENERATION)	USER INTERFACE ERRORS

REMARKS :

AIRFIELDS MULTI-PAGE REPORT

DATA RECORDING & ANALYSIS

CRITERIA SELECTED	TIMING (END-TO-END)	TIMING (REPORT GENERATION)	USER INTERFACE ERRORS

REMARKS :

AIRFIELDS TURNAROUND CALCULATION

DATA RECORDING & ANALYSIS

CRITERIA SELECTED	TIMING (END-TO-END)	TIMING (REPORT GENERATION)	USER INTERFACE ERRORS

REMARKS :

AIRFIELDS SELECTIVE DATA RETRIEVAL

DATA RECORDING & ANALYSIS

CRITERIA SELECTED	TIMING (END-TO-END)	TIMING (REPORT GENERATION)	USER INTERFACE ERRORS

REMARKS :



4.2 Planned Tests. The following paragraphs represent the tests that will be performed:

4.2.1 Items to be Tested. This section describes items (CSCIs) to be tested and includes the Graphical User Interface, the Airfields One-Line Summary Report, One-Page Summary Report, Multi-Page Report, Turnaround Calculation, Selective Data Retrieval, and the Coordinate-Radius Calculation. Each CSCI will be tested for speed and reliability, performance, timing, erroneous input, maximum capacity/stress testing, and functionality.

4.2.1.1 Graphical User Interface. The Graphical user interface will be tested for accuracy and reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Refer to the chart on the next page for items tested:

GRAPHICAL USER INTERFACE

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
APPEARANCE				
SPEED				
RELIABILITY				
FUNCTIONALITY				
FILE				
EDIT				
REPORT				
HELP				



4.2.1.2 One-Line Summary Report. The One-Line Summary Report will be tested for accuracy and reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Timing metrics for each CSCI were gathered in Section 4 of this document. Refer to the chart on the following page for all items tested:

CSCI: ONE-LINE SUMMARY REPORT

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
PERFORMANCE/RELIABILITY				
ERRONEOUS INPUT				
MAXIMUM CAPACITY (STRESS)				
OUTPUT APPEARANCE				
OUTPUT READABILITY				
"OK" FUNCTION				
"CANCEL" FUNCTION				
"HELP" FUNCTION				
"ADD" FUNCTION				
"REMOVE" FUNCTION				

4.2.1.3 One-Page Summary Report. The One-Page Summary Report will be tested for accuracy/reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Timing metrics for each CSCI were gathered in Section 4 of this document. Refer to the chart on the next page for all items tested:

CSCI: ONE-PAGE SUMMARY REPORT

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
PERFORMANCE/RELIABILITY				
ERRONEOUS INPUT				
MAXIMUM CAPACITY (STRESS)				
OUTPUT APPEARANCE				
OUTPUT READABILITY				
"OK" FUNCTION				
"CANCEL" FUNCTION				
"HELP" FUNCTION				
"ADD" FUNCTION				
"REMOVE" FUNCTION				

4.2.1.4 Multi-Page Report. The Multi-Page Report will be tested for accuracy and reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Timing metrics for each CSCI were gathered in Section 4 of this document. Refer to the chart on the next page for all items tested:



CSCI: MULTI-PAGE REPORT

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
PERFORMANCE/RELIABILITY				
ERRONEOUS INPUT				
MAXIMUM CAPACITY (STRESS)				
OUTPUT APPEARANCE				
OUTPUT READABILITY				
"OK" FUNCTION				
"CANCEL" FUNCTION				
"HELP" FUNCTION				
"ADD" FUNCTION				
"REMOVE" FUNCTION				

4.2.1.5 Turnaround Calculation. The Turnaround Calculation will be tested for accuracy and reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Timing metrics for each CSCI were gathered in Section 4 of this document. Refer to the chart on the next page for all items tested:

CSCI: TURNAROUND REPORT

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
PERFORMANCE/RELIABILITY				
ERRONEOUS INPUT				
MAXIMUM CAPACITY (STRESS)				
OUTPUT APPEARANCE				
OUTPUT READABILITY				
"OK" FUNCTION				
"CANCEL" FUNCTION				
"HELP" FUNCTION				
"ADD" FUNCTION				
"REMOVE" FUNCTION				

4.2.1.6 Selective Data Retrieval. (NOTE: The Selective Data Retrieval will not be delivered as part of Version 1.0.4.) The Selective Data Retrieval will be tested for accuracy and reliability. The primary intent of the test is to determine if the CSCI performs as it was intended to perform. Timing metrics for each CSCI were gathered in Section 4 of this document. Refer to the chart on the next page for all items tested:

CSCI: SELECTIVE DATA RETRIEVAL

ITEMS TESTED	PASSED	FAILED	MESSAGE GENERATED	REMARKS
PERFORMANCE/RELIABILITY				
ERRONEOUS INPUT				
MAXIMUM CAPACITY (STRESS)				
OUTPUT APPEARANCE				
OUTPUT READABILITY				
"OK" FUNCTION				
"CANCEL" FUNCTION				
"HELP" FUNCTION				
"ADD" FUNCTION				
"REMOVE" FUNCTION				

5. **TEST SCHEDULES**. Testing will be conducted at 5600 Columbia Pike in Falls Church, Virginia on the following dates:

- a. 21 August 1995 through 24 August 1995
- b. 5 September 1995 through 8 September 1995
- c. 11 September 1995 through 15 September 1995
- d. 26 December 1995 through 29 December 1995
- e. 2 January 1996 through 5 January 1996

Testing of the classified system at the OSF in Reston, Virginia will be accomplished during the week of 26 December through 29 December 1995.

Listings containing input data and output resulting from these planned tests will be appended to this Software Test Plan.

## 6. **NOTES.**

### 6.1 Terms and Abbreviations

CFSW	Center for Software
COBOL	Common Business Oriented Language
COE	Common Operating Environment
DDA	Designated Development Agency
DID	Data Item Description
DISA	Defense Information Systems Agency
DMAAC	Defense Mapping Agency Aerospace Center
GCCS	Global Command and Control Systems
GUI	Graphical User Interface
JIEO	Joint Interoperability & Engineering Organization
OPR	Office of Primary Responsibility
RDBMS	Relational Data Base Management System
SDP	Software Development Plan
SNF	Secret/No Foreign [dissemination]
SRS	Software Requirements Specification
STD	Standard
	Software Test Description
STP	Software Test Plan
STR	Software Test Report
SVD	Software Version Description
WWMCCS	Worldwide Military Command and Control Systems